UNIVERSITY OF MINNESOTA COMPUTER CENTER
Deadstart Systems Newsletter

11 December 1979 Vol. 5, No. 23

Send all comments, criticisms and contributions to the editor: T. W. Lanzatella
University Computer Center, 2520 Broadway Drive, Lauderdale, MN 55113.
The University of Minnesota is an equal opportunity educator and employer.

TABLE OF CONTENTS

NOTICE OF CHANGES TO THE SYSTEM

The following changes will be installed on Thursday, 13 December.

John Larsen installed a handy option into MST, the mass storage test. The option is N=* and causes the routine to write on a disk until a track limit is encountered. The test then proceeds normally.

Tom Lanzatella installed a change which causes PFM to use permanent file controls specified in the IPRDECK for all requests from SSJ= jobs instead of the values in PFCW in the control point area. This change helps RFM users whose PF validations are less than those of the user number where the file is to be stored.

Kevin Matthews solved a nagging space problem in PP-MTR in a novel way. The routine is now made up of the main program, MTR, and five CM resident overlays 9MA-9ME. As necessity is the mother of invention, the need to convert performance measurement code from R3 inspired this work. Kevin also applied unspecified changes to OEF, ODV, UEF and UIM.

Don Mears installed the following changes.

1) Link malfunction processing in 1TD was improved in several ways. Specifically, all errors will be retryed 64 times before offing the equipment and all errors will be logged.

2) STOP processing with master DISTC set (a notify attribute) was repaired.

3) Don repaired a coding error in 1TA where T1 was being wrecked by certain calls to DFM.

4) 1TD was repaired to prevent lost input characters during C/R processing.

Marisa Riviere enhanced FETCH processing in CALLPRG to handle multiple user libraries instead of one. Documentation for PT (procedure type) was also added.

Bill Sackett changed SUN to behave exactly as SUI. Previously, the command was performing and enforcing validations. Bill also repaired two critical errors in ECSMSA processing in CPUMTR and in 6DE. These corrections were actually made to the AT system as it would not run without them.

Jeff Drummond changed 1DD abort processing to be somewhat more noticeable by operators. Program EXPLIB was also changed to correct an error in user number processing.

Brad Blasing contributed a new version of the Cyber loader with a correction for his CMU speed-up code for the user-called loader (not the control statement loader).

PROPOSED CHANGES TO THE SYSTEM

PF Limits for SSJ= Job - by T. W. Lanzatella

I propose to change the way PFM checks permanent file limits when called by a SSJ= jobs. By PF limits I mean:

FC - number of permanent files allowed
CS - cumulative size in PRU's for all indirect access permanent file
FS - maximum size of any single indirect access permanent file
DS - maximum size of any single direct access permanent file.

The problem at hand is that whenever a CALLPRG file maintainer attempts to add a new CALLPRG file with RFM, PFM sometimes bombs with the message CATALOG OVERFLOW - FILES. The reason this occurs is that PFM checks the PF limits of the user number making the RFM request, not the limits of the user number where PFM is to place the file (usually CALLPRG or WRITEUP). An operational solution to this problem would be to raise all staff PF limits to those of CALLPRG. Since CALLPRG limits are quite large this is not acceptable. Two software solutions exist:

1) Change CPM SSJ processing by increasing the size of the SSJ block and swap PFCW when a SSJ= job is loaded.

2) Change PFM so that when a request comes from a SSJ= job, PF limits specified in the IPRDECK are used. Each job origin has a set of PF limits.

One problem with method 1 is that when a SSJ block is swapped, infinite limits would be placed in PFCW thus providing opportunity for a malicious user to create an infinite number of permanent files. Method 2 would be safer assuming that reasonable limits are specified in the IPRDECK.

//////////

TELEX Up/Down Messages - by J. Fairweather

Currently the only means of generating accurate TELEX statistics is to use the Account Dayfile dump tapes as input. However, the Accounting Group maintains disk files of accounting messages, for both machines from which all messages with a message prefix starting with Z are prescanned out. Presently, the TELEX up and down messages sent to the Account Dayfile have a ZLSY message prefix. I would like to propose an additional Account Dayfile message. The message would be issued by TELEX when it goes up and down. If the message prefix were, for example, ACTX, the messages would appear as:

NR.MN.SC.Telex _SY.ACTX,_Telex

HR.MN.SC.Telex _SY.ACTX,_Telex2

By using the Accounting Group's disk files:

1) I wouldn't have to prescan the Account Dayfile tapes;

2) the Monthly Telex Statistics would be less effected by changes to the Sport file during the month; and

3) the previous accounting periods Telex statistics would be available the following day.

//////////

More XEDIT - by S. E. Collins

The window margin feature of XEDIT, as it is currently implemented, is not overly useful. Since a user is limited to only one window margin setting, it must be frequently set and reset if he wishes to take full advantage of the benefits of using the windows. I would like to add the capability to retain and manipulate ten sets of window margins at any time. Any of these window margins could be used by indexing them with a single digit preceding the "W" or "A" postfix on any command. For example, "LOCATE3W/string/" would reference window margin three.

With this ability, one could set a number of window margins (e.g., the five fields used on a COMPASS statement) and easily limit string searches, etc., to only a limited portion of each line, without having to reset the window margin each time a different field is used.

With the implementation of the JUSTIFY command, a problem has arisen. In certain cases, the number of lines after justification of text exceeds the

number from which text was removed. Rather than simply adding a blank line to the file to place the justified text into, I would like to implement a command to allow the user to input a "filler" line to be used (by default, this would be a blank line).

//////////

Redefining the Global Library Set through CALLPRG or "Do We All Know What Goes on with the Libraries?" - M. Riviere

I wish to make a modification to CALLPRG in order to extend the function of the UL parameter. The extension allows several user libraries to be added to the global library set in a single index entry. Previously, the UL parameter allowed only one library to be defined for each entry. This modification is needed to accommodate the existance and facilitate the access to and usage of several local UCC user libraries such as compiler dependent libraries. With appropriate index entries installed, users are able to have all the libraries needed for each special package and/or job defined as part of their global library set by using a single "FETCH,..." statement.

The need for this modification appeared as a result of the resolutions of the committee formed to analyze the status of our System's Libraries and Compilers based on my article "A Fairly Confusing Description..." published on the November 6 issue of the DSN, Vol. 5, No. 21.

After the CALLPRG modifications were developed (almost as an emergency) the committee resolutions were posponed until the end of the winter quarter and some aspects of the resolutions may still be reviewed. Providing enough user's information about the change is perhaps the major factor on delaying the changes.

The selective assignment of user's libraries through CALLPRG was suggested by the committee as a more sensible approach for providing the Loader with information about the libraries to be used for each particular job than M. Frisch's request to modify the MNF and FTN compilers making them build larger LDSET tables pointing to all the needed libraries. The M. Frisch request to modify the compilers originated in the decision to remove the local UCC sections of FORTRAN and MNFCLIB and split this section into several other libraries. More than one extra library was going to be used for each one of the removed sections of FORTRAN and MNFCLIB in order to accommodate separately the compiler dependent routines and the ones that can be used in common by the different compilers. The new LDSET tables were going to direct the Loader to scan all the likely needed new libraries.

The idea of splitting the libraries into smaller ones was, of course not discussed by the committee. The reduction in the size of the most commonly used libraries (FORTRAN and MNFCLIB) was a very positive and long expected resolution. Using shorter libraries containing the most commonly used routines can considerably increase the load time for programs that need only standard relocatable subroutines from the libraries.

The arguments against the extension of the LDSET tables were mainly the incompatibility with CDC installation and the possible confusing future consequences

of generating relocatable binaries for the system libraries. These binaries were also going to include LDSET tables provided by the modified compilers.

Although the library modifications are not taking place now, I will proceed here to describe how the UL parameter works in CALLPRG. The description and a possible further implementation of the change can be taken as a base to continue considering a new library assignment scheme which, I hope, will be implemented at the end of the winter quarter.

With the extension of the UL parameter in CALLPRG and adequate index entries we can proceed to split the libraries but avoid modifying the compilers. In this way we can have a capability to provide a fairly efficient and neat access to our different library sets. The inconvenience of needing the extra fetch statement for the users of special libraries is minimal and largely compensated by several other factors such as requiring a shorter time used to load their relocatable binaries, making the information about the libraries in usage easily available (STATUS,L or listing the CALLPRG index entry), providing portability of MNF and FTN created binaries since these binaries will not include local Loader tables created to fullfill our own libraries arrangement.

The way in which the UL parameter works now is as follows: The requested libraries are added to the global library set. If the requested libraries are a group such that once they are added to the already existing global library set and they could make the set exceed its allowable size the addition does not take place. CALLPRG prints the message "REVIEW GLOBAL LIBRARY SET" and aborts afterward. The allowed size of the global library set is two user's libraries and two system's libraries, or one user's library and thirteen system's libraries, or twenty-four system's libraries.

Each FETCH, LIBNAME statement may define one or more libraries at the same time. Each FETCH, LIBNAME statement increases the global library set and therefore the library count.

The CALLPRG index entries created to process a given FETCH, LIBNAME statement should be set up in a way such that the number of libraries that the statement defines remains within the permissible count. A sequence of FETCH statements issued to accomplish a certain job step could exceed the permissible limits. Hence, users will have to be careful when using several succesive fetch statements.

There may be cases when the user happens to have a global library set defined for a previous load operation. (The global library set could be defined either by using the LIBRARY statement and/or FETCH, LIBNAME statements associated with a different compiler.) In this case, the new libraries defined by the FETCH, LIBNAME statement could make the global library set exceed its allowed limits.

In most of the cases the old libraries should be dropped and a new global library set should be again redefined (the LIBRARY statement without any parameters clears the global set). It is not likely that all the previously defined libraries and the new ones have to be used at once. If that happens a different job set up should be made.

Dropping the old global library set and the redefining a new set should be advisable for a new job load and execution step, specially if the new step involves the use of a different compiler produced binary.

Clearing the old library set avoids conflicts that can arise when a record with identical name exists in two different libraries. The record from the wrong library could be the one that is loaded if the previous library is still defined as a user library. There is restriction about the libraries defined with the UL being either local files provided by the user, files retrived by CALLPRG or existing system's libraries. Example: The index entry "LIB, TY=FETCH, UN=... IA=LIB, UL = LIT + OTHER + FORTRAN" will retrieve, upon the user's statement "FETCH, LIB", file LIB and set it as a user library. This entry will also define the local file OTHER and the system library FORTRAN as part of the global library set. If, in a particular case, FORTRAN happens to be a local file this fact will make no difference for its definition as part of the global set. The increase in the number of libraries in use will be two for local libraries (LIB and OTHER) and one for system libraries (FORTRAN).

Since a much larger number of system libraries than local libraries can be defined as part of the global library set we may perhaps consider when the new libraries arrangement will be implemented, to increase our set of system libraries with the most commonly used CALLPRG libraries. (The required version of each library could continue being retrieved by CALLPRG but they will add up to the systems libraries count that is much generous than the local count. Up to 64 libraries can be included in the system. We now have between 10 and 15. The number varies in each computer.

//////////

Ex Post Facto Proposal #1 - by D. W. Mears

The number of 64 port MUXES 1TD can support was reduced to 3 in order to free up enough space in 1TD to add the PDP11 support and other local features.

I now have two problems. One is that MERITSS has four MUXES now and will have five MUXES when they get their PDP11 for 1200 baud. Somehow 200 bytes will have to be found in 1TD in order to increase the number of MUXEX supported to five. This will be needed before the first MERITSS NOS test day on November 11.

The other problem is that the PDP11 link error processing in 1TD needs to be improved. Currently, 1TD times out functions and verifies the link address register when it sets it. When 1TD detects an error, it issues a message to the console B-display, turns the equipment off in the EST and ignores the PDP11 until the equipment is turned back on again. The assumption is that these errors will occur rarely and when they do, the operators will record which status lamps are lit on the link and with this information Field Engineering can fix the link. In fact, what happens is: About once a month the link malfunctions in a way 1TD does not detect in any graceful way (1TD simply hangs on the channel). Eventually TELEX notices that 1TD is not running any more and puts a message on the B-display. Then, depending on which operators are around and how long it has been since the last link problem, the operators might possible record which link status lights are lit and will probably turn the equipment back on in the EST in a reasonable period of time. Lastly, Field Engineering is unable to fix this problem because the error is totally un-reproducable and occurs so seldom.

1TD must be changed to detect more link errors by timing out data transfers on the channel, to retry all operations when errors are detected, to issue a message for errors detected, and to not turn the equipment off in the EST unless there is a solid error. This will eliminate the need for operator intervention for everything except serious link/PDP11 problems and will improve the ability of 1TD to service non-PDP11 ports when a PDP11 problem occurs.

I need space in 1TD to add the new improved link error processing and the support for the additional two MUXES for MERITSS. To do this, I want to remove the support for correspondence code terminals such as the IBM 2741 or NOVAR 5-41 (MECC has already done this).

My justifications for eliminating correspondence support are: Although one MUX on MERITSS and the 2551 on the 172 can talk to correspondence code terminals, no one has ever succeeded in getting any of these terminals to work on our systems. These terminals would require a separate rotary because they are not at all compatible with ASCII terminals, and because it would not be practical for us to use the CDC auto terminal type select capability. If these terminals were available many users would not use them because of their low speed (134.5 baud). This is an easy to get space in 1TD since it consists of deleting a lot of code. This shortens TELEX field length by 220 words by removing the COR and CORAPC terminal types.

//////////

Ex Post Fact Proposal #2 - by D. W. Mears

I would like to install the code I have written to utilize the status and control register on the 170's to deadstart individual PP's on line.

A PP is deadstarted by entering the DSD command "DSXX." (where XX is the PP to be deadstarted). The specified PP must not be DSD or MTR and must be assigned to some control point. The channel corresponding to the specified PP must be unreserved on the display channel. The "DS" syntax is DSD resident so that if the deadstart command overlay is CM resident, PP's can be deadstarted even if the system is completely hung.

The "DSxx" command causes DSD to:

1) Transmit a 4 byte idler program to the PP. (The idler reads word 4 of the message buffer into TO to T4 and executes it).

2) Move the contents of the output register to word 5 of the PP's message buffer.

3) Clear the output register.

4) Store the PP P-register from 12 cycles before the deadstart in byte 0 of word 6 of the message buffer.

5) Change the name of the PP to HNG and move it to the system control point, and

6) Drop any channels the PP had reserved.

The PP program DPP will dump the "HNG" PP to CM and reload PP resident. Entering "X.DPP." from DSD will reload 1 deadstarted PP without performing a dump. The DSDI "LS" option will now call DPP to dump the PP's and reload PP resident for all deadstarted PP's. For example, "DSDI,LS,Z./AP,HNG" will dump all deadstarted PP's.

There are a few problems with PP deadstart however.

1) If a PP is deadstarted while doing a central read or write, all PP's on that chassis will hang on subsequent central reads or writes. A recovery deadstart will be required.

2) Frequently, the deadstarted PP will have some resource interlocked. A PP doing I/O may have hardware or software unit reserves set. A queue manipulating program may have FNT interlocks set. PFM may have tracks interlocked. Figuring out what is interlocked and how to clear the interlock is beyond what can be expected from the operators.

3) It may be impossible to deadstart a given PP because its corresponding channel is reserved by another PP.

4) Not all of PP memory can be dumped. The deadstart idler destroys cells 0 to 4 and the dumper destroys cells 7763 to 7777. Deadstart dump to tape only destroys cells 0 to 3.

//////////

CTI and RMS Deadstart - by D. W. Mears

I think someone (perhaps ME) should install the NOS R5 CTI with RMS deadstart into our system for improved convenience, speed, and reliability of deadstart.

SYSTEM MAINTENANCE: People and Procedures

CALLPRG and Library Tape News - by M. Riviere

On November 15, S. Yen modified the Cybers 74/172 CALLPRG index in order to convert his newly introduced packages HICLUS, SINDSLC and KYSTA2A from being fetch types to be control card callable and also to introduce a future version of SPSS and SPSSONL.

On November 26, Kevin McMahon introduced fetch type entries in the Cybers 74/172 index for the art packages ARTSURF, PLTSIGN, SIGN and FAMTREE. Kevin also set up an entry for the past version of ARTPRINT. Documentation for this packages is available from the reference room.

The Cyber 720 NOS CALLPRG index was modified on December 1 with a new entry for ACCSTAT provided by Greg Jensen.

On December 12 the Cyber 74/172 CALLPRG index will have the addition of an entry for the fetch type user library EPISODE, an ordinary differential equations library, provided by Michael Frisch.

Also on December 12 I introduced entries on the 74/172 CALLPRG index for FTN level 501, and its associated libraries FORTRAN and SYSLIB. This version of the compiler will be offered as a future package, although it is quite likely that a newer version will eventually be the one that will replace the one in the System. I will also introduce the fetch type entry TEXT501 for part of the level 501 installation texts.

On December 10, Andy Mickel and Rick Marcus modified the 720 CALLPRG index. Andy's modifications consist in the introduction of a new fetch package, ID2TD and a future version of PASCAL and its libraries PASCLIB and PASIOL. ID2TD is a PASCAL utility. Rick's modifications will consist in introducing a new entry for APL and in replacing the existing APLUM index entry with a message to use APL instead of APLUM.

Almost similar modifications will be implemented by Andy and Rick on the Cybers 172/74 CALLPRG index. APL, however, will only be available on the Cyber 172.

In addition, Andy transferred J. Strait index entries for ARCHIVE to Kevin Matthews.

On December 16, Steve Reisman will change the Cyber 720 CALLPRG versions of S2000 and CONVBF. The new versions could not be offered during test times because they may produce some permanent files modifications not compatible with the KRONOS System.

The scheduled modifications for the Library tape to go into production in the three computers on December 16 are going to be mainly the replacement of TSF and MNF and some small changes to FORTRAN and MNFCLIB.

MNF and TSF and their associated libraries will be replaced by their future versions. On the Cyber 720, however, TSF will be the version of the compiler that runs at smaller field length. The only modifications to take place among the system's libraries after all the attempted libraries re-arrangement will be some minor modifications to FORTRAN and MNFCLIB. The modifications to MNFCLIB and some of the modifications to FORTRAN are the replacement of few records on the local arithmetic sections of the libraries made by M. Frisch. Additional modifications to FORTRAN are the replacement of the PROCPAC section by new binaries provided by Kevin Fjelstad and Dean Nelson. The PROCPAC modifications consist mainly in small errors fixes and code clean up.

After all, the libraries and the compilers on the Cybers 74/172 are not going to be much different on December 16 of what they were before. The library tape shceduled on the Cyber 720 for December 16 was the one in use of the last December 10 testing time. All the products that are available in the Cyber 720 as well as in the Cyber 74 and have identical names are now identical with the exception of the already mentioned smaller version of TSF.

The next set of CALLPRG and library tape modifications will be implemented on January 2. Modifications for that date should be submitted before noon December 19.

I will be taking vacation from December 20 to January 22. Modifications submitted after the December 19 deadline should be sent directly to Tom Lanzatella. Tom will be helping me by maintaining CALLPRG and the libraries during my vacation. Tom will be implementing the submitted modifications on January 15. The modifications should be sent to him before noon January 10.

//////////

Report on CALLPRG Files - by M. Riviere

Once a quarter I will be sending a report describing the status of the CALLPRG files to everyone who handles files on the CALLPRG Account Number. The report is a product of some modifications to RFM and additional programming for CALLPRG file maintenance made by Ivone Murray. The purpose of the report is to achieve some successful cleaning up results among the CALLPRG files. Any one interested in receiving the report who is not a CALLPRG file owner and therefore not included on the circulation list, should notify me. The report consists in four parts.

The first part is some graphs showing the number of CALLPRG files (and PRU's) that have not been accessed in the past month, the past two months and the past three months. These graphs can give us an idea of how poorly we are perhaps utilizing disk space.

The second part has two lists of file names. One list includes files that, although they are referenced in the CALLPRG index, they are not available on the SPL pack. The other list is a list of files that do exist on the SPL pack but they are not referenced by the index. This second list includes the account number of the file owner for each listed file. Please check this list to assure that all your files are right. That is, neither any one of your CALLPRG files are missed nor you are leaving some forgotten files to stay on the CALLPRG account forever. When looking at this part of the report take into consideration that if a file is listed as a file that is not referenced in the index this fact does not necessarily mean that the file should not be residing in the CALLPRG account. There are some CALLPRG maintenance files that do not have any reason to be included in the index. Some other files could also belong to new index entries that are in the process of being inserted.

The third part contains an RFCAT list of only unused files, grouped by file's owners. Some of the file's owners listed in there are not working at UCC any longer. I will appreciate it if the new persons in charge of the "apparently abandoned" packages can let me know who they are to assign new ownership to the concerned files. Before pointing your finger at every one else that has more unused files than you take a look at how many more products than you that person may be in charge of. If the ratio is worse than yours, then you can proceed with the accusation. (No names are mentioned here...but guess who...). One way or other, please start considering to place on tapes your relatively large unused files.

Finally, the last part of the report is a list of the CALLPRG index that

is provided there in order to make more convenient the comparison of entries, files names, owners, ect.

Please clean up! SPL is not full while I write this article but it may be when the article is printed... And we all know the problems that we have when SPL becomes full.

I will largely appreciate your help. We all will largely appreciate your help.

//////////

Cyber Deadstart Dump Analysis from Monday, 19 November through Thursday, 6 December - by K. C. Matthews

Wednesday, 28 November

16:23 (DD20) Cyber 172
The system hung when a disk error occured during a job rollout. Our current code is not very graceful when errors occur on the rollin file. This would be a good project for someone to investigate.

Saturday, 1 December

14:50 (DD2023) Cyber 172
A copy of PFM hung. There were disk error messages displayed at several control points. Problems with the disk controller on Channel 31 are suspected as the cause of this crash.

15:30 (DD2024) Cyber 74
The system was hung up again. Channel 31 disk error messages appeared in many places. Jeff eliminated the Channel 31 access from most drives, and this enabled the system to stay up for the rest of the day.

Thursday, 6 December

(08:01) DD2001 Cyber 74
CIO hung while processing a presumably bad file on pack SPL. Both machines were hung up by an interlock file. This dump still needs further analysis.

//////////

Cyber 170/720 Deadstart Dump Analysis (11/19-12/9) - by R. A. Williams

Date	Description	Tape
791119	A systems staff member saw TELEX abnormal messages and intervened to fix them. TELEX was dropped but, in fact, everything was running normally except for a handful of ports on one timeplexer. A good rule to follow is as long as you can log in, enter a program, and run it	N.A.

successfully, don't touch anything unless positive a large number of other users are having problems.

791207 The LIBRARY tape had been over-written with NOS library information. This was determined about two hours after the system came up. It was taken down and the error corrected by using an old version of the KRONOS libraries. N.A.

//////////

TELEX and TELEX PDP11 Crash Analysis 11/18 to 12/9 - by D. W. Mears

11/19 We installed a new version of the 2551 Emulation Cortrolware which we hoped would eliminate our occasional hung port problem. However, instead of getting the usual one or two hung ports, we had over thirty hung ports by the end of the day. On 11/20 we reinstalled the old controlware.

12/1 15:16 The TELEX PDP11 was reloaded from the Cyber 74 due to an operations mixup in the level 0 deadstart procedures. When TELEX on the Cyber 172 detected the PDP11 was no longer running, it turned off the PDP11 in the EST and put up a message on the B-display. The operators gave the message a "go" promptly, but the equipment in the EST was not turned on until 11 minutes later.